PB91-110536

Pesticide Fact Sheet Number 218
'Trichoderma harzianum' Rifai Strain KRL-AG2

(U.S.) Environmental Protection Agency, Washington, DC

Nov 90

U.S. Department of Commerce
National Technical Information Service
NTIS

United States
Environmental Protection
Agency

Office of Pesticides and Toxic Substances
Office of Pesticide Programs (TS-766C)
Washington, DC 20460

540/FS-91-119

PB91-110536

EPA

Pesticide Fact Sheet

Name of Chemical: Trichoderma harzianum Rifai Strain KRL-AG2
Reason for Issuance: Registration of New Biological
Date Issued: November 1990
Fact Sheet Number: 218

1. Description

Generic Name:	Trichoderma harzianum Rifai Strain KRL-AG2
Trade Names:	F-Stop Biological Fungicide Concentrate and F-Stop Biological Fungicide Seed Protectant
EPA Shaughnessy Code:	128903
Year of Initial Registration:	1990
Pesticide Type:	Biofungicide
U.S. and Foreign Producers:	Eastman Kodak Company 343 State Street Rochester, New York 14650

2. Use Patterns and Formulations

Application sites: The manufacturing use product (MP) is for use only in the formulation of fungicides. The end-use product (EP) is for use in the control of damping-off and seed rot diseases caused by Pythium species on beans (green and dry), cabbage, corn (field and sweet), cotton, cucumbers, peanuts, potatoes, sorghum, soybeans, sugar beets, and tomatoes.

Types of formulations: Both products are identical and are powdered formulations containing 98% of the active ingredient. The active ingredient is a genetically modified strain of Trichoderma harzianum derived by protoplast fusion of two auxotrophic mutants of Trichoderma.

Types and methods of application: The EP is a seed treatment applied as a water-based slurry or in combination with diluents, carriers and/or adjuvants approved for coating seed through standard slurry or mist type commercial seed treating equipment.

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U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL
INFORMATION SERVICE
SPRINGFIELD, VA 22161

BIBLIOGRAPHIC INFORMATION

PB91-110536

Report Nos: EPA/540/FS-91/119

Title: Pesticide Fact Sheet Number 218: 'Trichoderma harzianum' Rifai Strain KRL-AG2.

Date: Nov 90

Performing Organization: Environmental Protection Agency, Washington, DC. Office of Pesticide Programs.

NTIS Field/Group Codes: 68E, 98C, 57H, 57Y

Price: PC A02/MF A01

Availability: Available from the National Technical Information Service, Springfield, VA. 22161

Number of Pages: 6p

Keywords: *Pesticides, *Fungicides, Hazardous materials, Chemical properties, Regulations, Ecology, Toxicology, Agricultural products, *Toxic substances, *Trichoderma harzianum Rifai Strain KRL-AG2, Path of pollutants, Chemical information fact sheet, Use patterns.

Abstract: The document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on the pesticide, Trichodema harzianum. A Fact Sheet is issued after one of the following actions has occurred: Issuance or reissuance of a registration standard, Issuance of each special review document, Registration of a significantly changed use pattern, Registration of a new chemical, or An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

5272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO.	2.	PB91-110536

4. Title and Subtitle

EPA Pesticide Fact Sheets - Trichoderma harzianum No. 218

PB91-110536

5. Report Date

6.

7. Author(s)

EPA, Office of Pesticide Programs, Registration Division

8. Performing Organization Rept. No.
540/FS-91-119

9. Performing Organization Name and Address

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10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(C)

12. Sponsoring Organization Name and Address

Same as #9

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the the following actions has occurred: Trichoderma harzianum.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, science findings.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement:	19. Security Class (This Report)	21. No. of Pages
Publicly Available	Unclassified	
	20. Security Class (This Page) Unclassified	22. Price

(See ANSI-Z39.18)

See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

Application rate: The EP is applied at the rate of 5 ounces of product per 100 pounds of seed.

3. Science Findings

Summary Science Statement:

The toxicological data which were submitted for this active ingredient included reports of an acute oral toxicity/pathogenicity study, an acute pulmonary toxicity/pathogenicity study, and an acute intravenous toxicity/pathogenicity study. The studies were performed using rats. All studies were classified as acceptable. The review of these studies indicated that the biofungicide is not toxic to, infective in, or pathogenic to rats by oral, pulmonary or intravenous routes of exposure.

A request that acute dermal toxicity testing be waived for this biofungicide was made based on the fact that the parent organism is wide spread and innocuous in nature. To support the waiver, additional information on worker exposure was requested. Information on the history of the production process, a summary of sources of operator exposure and the number of exposure hours for a typical employee were submitted. The major potential source of worker exposure occurred during the fermentation process. No workers have shown evidence of dermal sensitivity to the organism and at other steps in the manufacturing process no indication of adverse effects were shown. Based on this information and the results of the acute studies, the acute dermal toxicity testing was waived because there is little likelyhood of acute effects from dermal exposure.

A primary eye irritation study was conducted on rabbits. The Trichoderma harzianum strain initially caused slight irritation to the eyes but no irritation was noted at 7 days after treatment. No incidents of hypersensitivity in humans have occurred during the development of the products.

The company was also requested to identify any sources of bacterial contamination and the steps in the manufacturing process where contamination might occur to ensure the absence of pathogenic microorganisms and/or toxins. No human or animal pathogens were detected in any of the production batches of the products.

To support the lack of adverse effects on wildlife, an avian oral pathogenicity/toxicity study on bob white quail was submitted which indicated that the test organism is practically nontoxic to terrestrial avian species by ingestion. The

requirement for tests on aquatic birds was waived because it is not expected that the fungus will enter the aquatic environment since its only use is as a seed treatment. Data requirements for evaluating adverse effects on freshwater fish and invertebrates, estuarine and marine organisms, nontarget plants and insects and honey bees were waived. The seed treatment use pattern makes it unlikely that Trichoderma would enter aquatic environments, contact nontarget plant species or that honey bees or other insects would be exposed to the organism.

Because only minimal exposure, if any, to nontarget organisms may occur from the use of this biofungicide as a seed treatment, there is not expected to be a "may effect" situation with regard to endangered species.

Data for environmental fate (Tier II) are not required for this biofungicide because no more than negligible environmental exposure associated with the seed treatment use is likely and the initial (Tier I) tests were waived or not required.

Chemical Characteristics:

Property	MP and EP
Color	yellow-green
Physical state	powder
Odor	vinegar
Density/bulk density	fluffed - 28.8 lbs/cu ft. packed - 43.6 lbs/cu ft.
pH	6.17
Storage stability	184 days at 20°C
Viscosity	N/A
Miscibility	N/A
Corrosion characteristics	N/A

Toxicological Characteristics:

Acute effects: Data were submitted for acute toxicity/ pathogenicity as determined in oral, pulmonary and intravenous tests. Data were classified acceptable. The tests indicated that the product was not toxic to, infective in or pathogenic to rats.

Other toxicity information: Information was submitted which demonstrated that no human or animal pathogens were detected during the manufacturing process. Information was included on the history of the production process, a summary of sources of operator exposure and number of exposure hours for a typical

employee. No hypersensitivity or other toxicological effects attributable to working with the organism were reported.

Ecological Effects.

Data on the ecological effects of the biofungicide were included only for an avian oral pathogenicity/toxicity study on bob white quail. The test organism was practically nontoxic to terrestrial avian species by ingestion. Data requirements for all other ecological effects testing were waived based on the nature of the fungus and the facts that it is unlikely that the organism will enter aquatic environments and minimal exposure would be likely due to the seed treatment use pattern.

4. Benefits

The use of the end-use product will be beneficial in the control of damping-off and seed rot diseases of seedling plants which may be a source of economic loss by reducing the stand of plants in he field. The availability of a biological fungicide would provide a less toxic alternative to the currently registered chemical seed treatments.

5. Tolerance Assessment

An exemption from the requirement for a tolerance for residues of Trichoderma harzianum Rifai Strain KRL-AG2 on beans, (green and dry), cabbage, corn (field and sweet), cotton, cucumbers, peanuts, potatoes, sorghum, soybeans, sugar beets, and tomatoes when used as a seed treatment in accordance with good agricultural practices was requested. Since testing of the biofungicide showed not evidence of effects which would be of toxicological concern, an exemption will be granted.

6. Summary of Major Data Gaps

No data gaps exist for this active ingredient.

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